

1. A cleaning and multifunctional coating composition for treating a surface comprising

a cationic organosilane quaternary ammonium compound which is bondable onto said surface and

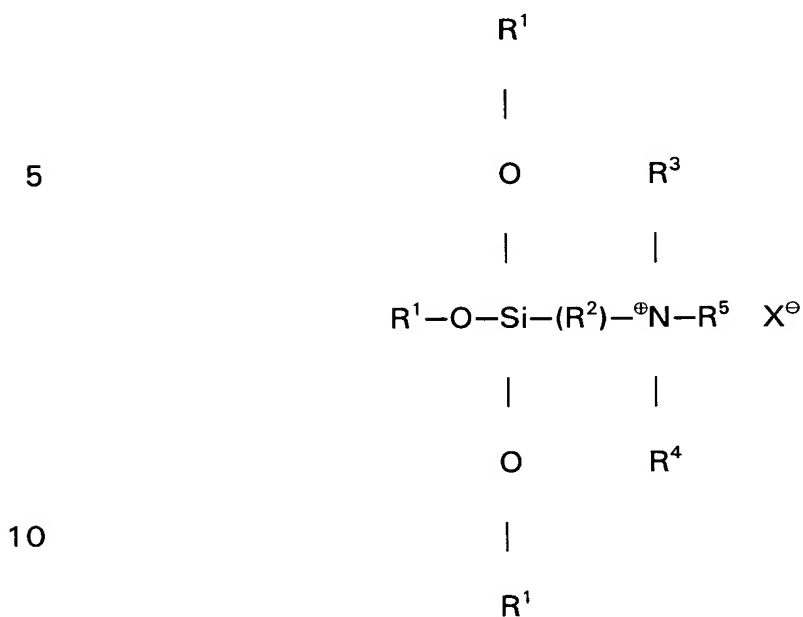
5 hydrogen peroxide in an aqueous media, said components in effective amounts for cleaning said surface and for bonding a multifunctional coating onto said surface thereby rendering it (a) water and soil repellent and (b) antimicrobial.

2. The composition of claim 1 wherein said quaternary compound has a C<sub>10</sub>-C<sub>22</sub> saturated or unsaturated hydrocarbon group.
3. The composition of claim 1 wherein said quaternary compound is present in an amount up to about 3% by weight and said hydrogen peroxide is present in an amount up to about 8% by weight.
4. The composition of claim 1 wherein said quaternary compound is present in an amount up to about 1% by weight and said hydrogen peroxide is present in an amount of about 3 to about 6% by weight.
5. The composition of claim 1 which further contains a solvent selected from the group of an alcohol, polyol, glycolether and mixtures thereof.
6. The composition of claim 5 wherein the polyol or alcohol is a glycol, propylene glycol monomethyl ether, methanol, ethanol or isopropanol.
7. The composition of claim 1 where the aqueous media is acidic.

8. The composition of claim 7 wherein the pH is on the order of about 2 to about 5.

9. The composition of claim 1 wherein the aqueous media is deionized water.

10. The composition of claim 1 wherein said quaternary compound is defined by the formula

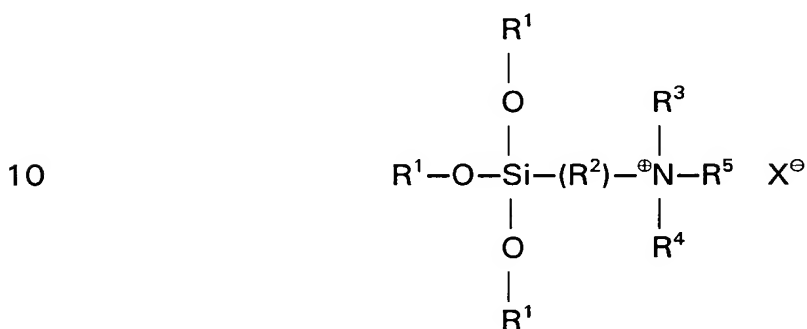


wherein  $\text{R}^1$  = hydrogen and/or  $\text{C}_1$  to  $\text{C}_4$  alkyl;  $\text{R}^2$  = divalent hydrocarbon radical with  $\text{C}_1$  to  $\text{C}_8$  carbon atoms,  $\text{R}^3$  = hydrogen or  $\text{C}_1$  to  $\text{C}_4$  alkyl,  $\text{R}^4$  = hydrogen or  $\text{C}_1$  to  $\text{C}_{10}$  alkyl,  $\text{R}^5$  =  $\text{C}_{10}$  to  $\text{C}_{22}$  saturated or unsaturated hydrocarbon radical and  $\text{X}$  = halide, carboxylate, sulfonate, hydroxide, sulfate, or phosphate.

11. A cleaning and multifunctional coating composition for treating a surface comprising

a cationic organosilane quaternary ammonium compound which is bondable onto said surface in an amount up to about 3% by

5 weight defined by the formula:



15 wherein  $\text{R}^1$  = hydrogen and/or  $\text{C}_1$  to  $\text{C}_4$  alkyl;  $\text{R}^2$  = divalent hydrocarbon radical with  $\text{C}_1$  to  $\text{C}_8$  carbon atoms,  $\text{R}^3$  = hydrogen or  $\text{C}_1$  to  $\text{C}_4$  alkyl,  $\text{R}^4$  = hydrogen or  $\text{C}_1$  to  $\text{C}_{10}$  alkyl,  $\text{R}^5$  =  $\text{C}_{10}$  to  $\text{C}_{22}$  saturated or unsaturated hydrocarbon radical and  $\text{X}$  = halide, carboxylate, sulfonate, hydroxide, sulfate, or phosphate

20 and

hydrogen peroxide in an amount up to about 8% by weight in an acidic deionized aqueous media, said components in effective amounts for cleaning said surface and for bonding a multifunctional coating onto said surface thereby rendering it (a) water and soil repellent

25 and (b) antimicrobial.

12. The composition of claim 11 wherein the pH of the acidic media is about 2 to about 5.
13. The composition of claim 11 which further contains a solvent selected from the group of an alcohol, polyol, glycolether and mixtures thereof.
14. The composition of claim 11 which further contains an alcohol selected from the group consisting of methanol, ethanol, and isopropanol.
15. The composition of claim 11 wherein said organosilane quaternary ammonium compound is selected from the group consisting of 3-(trimethoxysilyl)propyldimethyloctadecyl ammonium chloride, 3-(trimethoxysilyl)propyldidecylmethyl ammonium chloride, 5 3-(trimethoxysilyl)propyltetradecyldimethyl ammonium chloride, 3-(trimethoxysilyl)propyldimethylsoya ammonium chloride, 3-(trimethoxysilyl)propyldimethyloleyl ammonium chloride, 3-(trimethoxysilyl)propyloctadecyl ammonium chloride, 3-(trimethoxysilyl)propyloleyl ammonium chloride, and 10 3-(trihydroxysilyl)propyldimethyloctadecyl ammonium chloride.

16.           The composition of claim 11 wherein the organosilane quaternary ammonium compound is 3(trimethoxysilyl)dimethyloctadecyl ammonium chloride in an amount of from about 0.4 to about 0.7% by weight and the hydrogen peroxide is in an amount of about 3% by weight.
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17. A method for cleaning a surface and providing it with a multifunctional coating comprising
- applying to the surface a composition comprising a cationic organosilane quaternary ammonium compound which is bondable onto
- 5 said surface and hydrogen peroxide in an aqueous media,
- forming a clean, soil and water-repellent and antimicrobial coating bonded onto said surface.

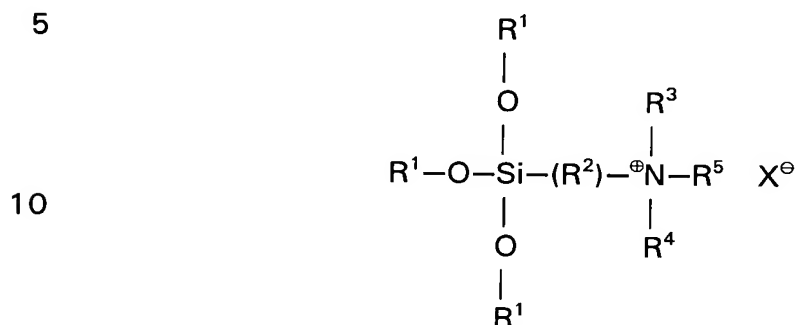
18. The method of claim 17 wherein the composition is applied as a liquid to a soiled surface,  
removing the soil from the surface and forming a clean, water and soil repellent and antimicrobial coating bonded onto said surface.

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19. The method of claim 18 wherein said soil is wiped off of said surface thereby forming said clean, water and soil repellent and antimicrobial coating bonded onto said surface.



20. The method of claim 17 wherein said composition comprises a cationic organosilane quaternary ammonium compound which is bondable onto said surface in an amount up to about 3% by weight defined by the formula:



wherein  $\text{R}^1$  = hydrogen and/or  $\text{C}_1$  to  $\text{C}_4$  alkyl;  $\text{R}^2$  = divalent hydrocarbon radical with  $\text{C}_1$  to  $\text{C}_8$  carbon atoms,  $\text{R}^3$  = hydrogen or  $\text{C}_1$  to  $\text{C}_4$  alkyl,  $\text{R}^4$  = hydrogen or  $\text{C}_1$  to  $\text{C}_{10}$  alkyl,  $\text{R}^5$  =  $\text{C}_{10}$  to  $\text{C}_{22}$  saturated or unsaturated hydrocarbon radical and  $\text{X}$  = halide, carboxylate, sulfonate, hydroxide, sulfate, or phosphate

and

hydrogen peroxide in an amount up to about 8% by weight in an acidic deionized aqueous media, said components in effective amounts for cleaning said surface and for bonding a multifunctional coating onto said surface thereby rendering it (a) water and soil repellent and (b) antimicrobial.

21. The method of claim 20 wherein the acidic media has a pH of about 2 to about 5.

22. The method of claim 20 which further contains an alcohol selected from the group consisting of methanol, ethanol, and isopropanol.

23. The method of claim 22 wherein said organosilane quaternary ammonium compound is selected from the group consisting of 3-(trimethoxysilyl)propyldimethyloctadecyl ammonium chloride, 3-(trimethoxysilyl)propyldidecylmethyl ammonium chloride, 5 3-(trimethoxysilyl)propyltetradecyldimethyl ammonium chloride, 3-(trimethoxysilyl)propyldimethylsoya ammonium chloride, 3-(trimethoxysilyl)propyldimethyloleyl ammonium chloride, 3-(trimethoxysilyl)propyloctadecyl ammonium chloride, 3-(trimethoxysilyl)propyloleyl ammonium chloride, and 10 3-(trihydroxysilyl)propyldimethyloctadecyl ammonium chloride.

24. The method of claim 17 wherein the organosilane quaternary ammonium compound is 3(trimethoxyxysilyl)dimethyloctadecyl ammonium chloride in an amount of from about 0.4 to about 0.7% by weight and the hydrogen peroxide is in an amount of about 3% by weight.

25. The method of claim 17 wherein the surface is selected from the group consisting of metal, glass, plastics, rubber, porcelain, ceramic, marble, granite, cement, tile, sand, silica, enameled appliances, polyurethane, polyester, polyacrylic, melamine/phenolic resins, polycarbonate, siliceous, painted surfaces and wood.
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